

APPLICATION FOR PATENT

TITLE: DEVICE AND METHOD FOR STABILIZING WRISTS AND ARMS

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This is application claims the benefit of the filing of co-pending U.S. provisional
10 application serial number 60/264,523, filed January 26, 2001, which is incorporated by
reference herein in its entirety.

BACKGROUND AND SUMMARY OF INVENTION:

Between one and one and half million people have been diagnosed with
15 Parkinson's Disease in the United States. As Parkinson's Disease progresses, many
sufferers develop tremors in their hands and arms, thereby making common activities
such as drinking from a glass, writing, and holding objects difficult if not impossible.
The present invention is directed to an arm brace designed to minimize the effects of
tremors on people suffering from Parkinson's Disease and other neurological or drug-
20 induced conditions.

BRIEF DESCRIPTION OF THE DRAWINGS:

Fig. 1 is a side view of the inventive brace.

Fig. 2 is an anterior view of the inventive brace.

25 Fig. 3 is a posterior view of the inventive brace.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS:

Referring now to the figures, the present invention is directed to an arm brace (10)
that is useful in minimizing the effects of arm and hand tremors in patients suffering from
30 neurological disorders, such as Parkinson's Disease or drug-induced disorders that cause
tremors of the extremities. Specifically, in certain embodiments, the inventive brace

comprises a sleeve (11) designed to be worn around the wrist and forearm of a person in need of the brace. The sleeve (11) of the brace (10) may be formed of any material typically used in athletic and orthotic braces, including, but not limited to, leather, neoprene, or cloth. Preferably, an elastomeric material is incorporated within the sleeve to provide a snug, yet comfortable, fit around the person's forearm and wrist.

The sleeve comprises a distal end (20) and proximal end (21), the proximal end (21) having an opening through which a person inserts his/her arm (A). The arm is inserted through the sleeve until the hand (H) exits the distal end of the sleeve and is engaged within the hand portion. Extending distally from the proximal end of the sleeve is a wrist portion (35), followed by a hand portion (30). The hand portion (30) of the sleeve extends around the posterior or back portion of the hand (H) and the anterior or palm portion of the hand (H). The hand portion (30) further includes an opening (31) through which the person's thumb (T) is inserted, as shown most clearly in Fig. 1.

The brace (10) may further include at least one strap (32) extending from the hand or wrist portions (30, 35) to secure the hand portion more snugly around the person's hand (H). The strap is oriented perpendicularly to the support members (12-14) (discussed below) and configured to circumferentially wrap around the hand or wrist portions. The brace may also include additional straps (33, 34), as shown, to secure the sleeve around the person's hand and forearm. The straps (32-34) may be fastened to the outer surface of the sleeve by means of VELCRO, snaps, or other suitable fastening means. Figs. 2-3 illustrate the use of a VELCRO strip (50) secured to the sleeve and the straps.

The brace (10) includes a series of elongated support bars (12-14), each of which is secured to the sleeve. [Alternative elongated members, such as rods, for example, may be employed; however, for ease of explanation, reference to this feature of the invention will be made to bars.] The support bars (12-14) may be formed of any suitable, non-flexible material, such as a stiff metal, metal alloy, or plastic, for example. Preferably, one bar (12) is secured to the posterior side (1) of the sleeve. This bar (12) extends from the wrist portion (35) of the sleeve and terminates near the elbow portion (i.e. distal end) (36) of the sleeve. A smaller second elongated bar (14) is preferably secured to the sleeve along the anterior portion (2) of the sleeve. The second bar (14)

extends from the distal end (20) of the sleeve comprising the hand portion (30) and terminates proximally just above the wrist portion (35) of the sleeve. The second bar may include a small, elevated contoured section (14a) to accommodate the base of the person's palm. The brace may further include a third elongated bar (13) (shown in phantom in Fig. 1) positioned on the posterior side (1) of the sleeve along the hand portion (30). The third bar (13) extends from the edge of the distal end of the sleeve and terminates near the wrist portion (35) of sleeve. This third bar (13) is preferably positioned along the sleeve such that it is longitudinally aligned with the wearer's index finger (I), middle finger (M), or between the index and middle fingers. Alternatively, the posterior support bars (12,13) comprise a single, integral bar or they may be hingedly connected. The positioning of the three support bars (12-14) allows for some wrist flexibility while simultaneously minimizing the effects of the person's arm tremors, in particular lateral tremors, caused by neurological (e.g. Parkinson's Disease, cerebral palsy) or drug-induced conditions. Optionally, the brace may include an outer elbow pad or shield (70).

Certain aspects of the inventive brace include a sleeve formed of a washable fabric. In this embodiment, it may be desirable to provide support bars, as described and illustrated herein, that are removable. Alternatively, the support bars may be permanently secured to the sleeve. Figs. 1 and 3 illustrate the use of straps (60) for holding the larger support bar (12) in place on the exterior surface of the sleeve (11). Alternatively, the support bars may be housed within a compartment sewn into or attached to the sleeve. In Fig. 3, for example, a compartment (15) is secured to the outer surface of the sleeve and configured to house most of the anterior support bar (14) (partially shown in phantom) with only the convex section (14a) of the bar exposed. The inventive brace may be fabricated in different sizes for use on either arm. Alternatively, separate left-arm and right-arm braces may be designed.

The inventor of the present invention tested his invention on six individuals suffering from Parkinson's Disease. The results of the study are discussed in Example 1.

Example 1

Six patients suffering from Parkinson's Disease were each given a container holding 15 ml of water. Without wearing the inventive brace, each patient was first asked to hold the water-filled container. The amount of water that spilled out the container due to the patient's arm and/or hand tremors was measured. Each patient was then asked to hold the water-filled container while wearing the inventive brace. The amount of water that spilled out of the container due to the patient's arm and/or hand tremors was measured. The amounts of water spilled from the container with the brace versus without the brace were compared, as shown in Table 1.

Table 1

	<u>Without Brace</u>	<u>With Brace</u>
Patient 1	7.5 ml	5 ml
Patient 2	7.2 ml	4.5 ml
Patient 3	10 ml	2.5 ml
Patient 4	5 ml	0 ml
Patient 5	7 ml	0 ml
Patient 6	6 ml	4 ml